

2/8/17

"In order to understand the value in a shortcut, one must have taken the long road first."
-Anonymous

HW: "Optimization Packet" page 123 #1
Test 1 on Thursday 2/16

AIM: Optimization continued

Warm Up:

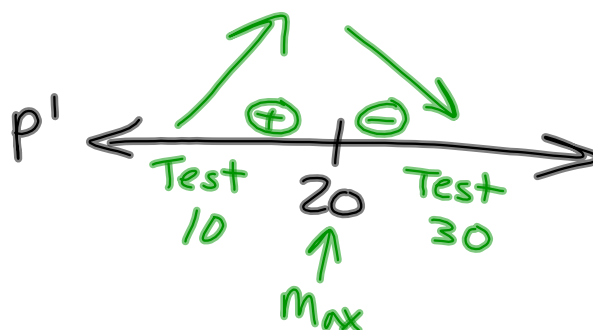
1. The profit for Ace Advertising Co. is $P = 230 + 20s - \frac{1}{2}s^2$ where s is the amount (in hundreds of dollars) spent on advertising. What amount of advertising gives the maximum profit?

$$s \geq 0$$

$$P' = 20 - s$$

$$0 = 20 - s$$

$$s = 20$$



$$P = 230 + 20(20) - \frac{1}{2}(20)^2$$

$$P = 430$$

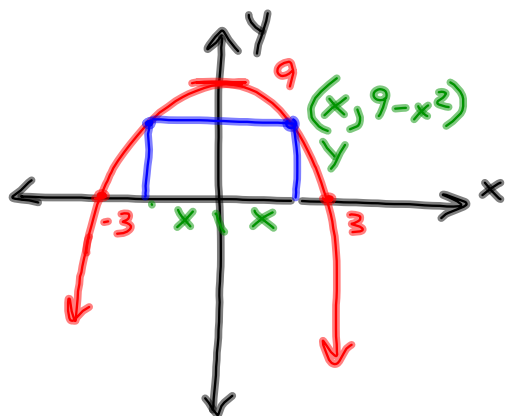
$$P = 230 + 20(0) - \frac{1}{2}(0)^2$$

$$= 230$$

$$s = 20$$

$$\$2000$$

2. Find the area of the largest rectangle with sides parallel to the axes, whose upper vertices are on $y = 9 - x^2$ and whose lower vertices are on the x-axis.



restrictions

$$0 < x < 3$$

$$0 < y < 9$$

$$(3-x)(3+x)$$

$$x=3 \quad x=-3$$

$$A = 2xy$$

$$A = 2x(9 - x^2)$$

$$A = 18x - 2x^3$$

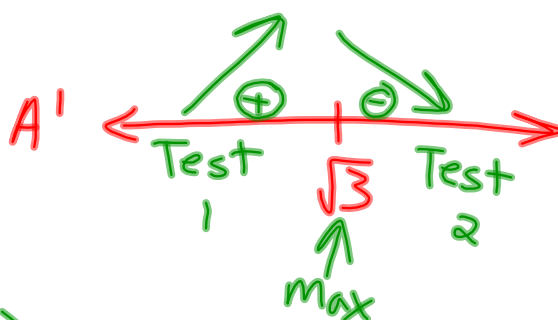
$$A' = 18 - 6x^2$$

$$0 = 18 - 6x^2$$

$$6x^2 = 18$$

$$x^2 = 3$$

$$x = \pm\sqrt{3}$$



Area =

$$= 2(\sqrt{3})(9 - \sqrt{3}^2)$$

$$= 2\sqrt{3}(6)$$

$$= \boxed{12\sqrt{3} \text{ units}^2}$$